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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,117	10/31/2003	Tetsuya Miyazaki	244822US2	8431

22850 7590 12/14/2006

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EXAMINER	
AZEMAR, GUERSSY	
ART UNIT	**PAPER NUMBER**
2613	

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/697,117	MIYAZAKI ET AL.	
	Examiner	Art Unit	
	Guerssy Azemar	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 13 is objected to because of the following informalities: Applicant's used the word "in-house" instead of "in-phase". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 11 – 13 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: An error control method that controls errors. With respect to claim 11, applicant only states the method of detecting errors, however does not state how the method controls errors.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3, 6, 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Choudhary et al. (20030118352).

(1) With respect to claims 1 and 6:

As shown in figure 3, Choudhary et al. teaches a phase modulation method comprising:

using a plurality of phase modulators (PM1 and PM2, blocks 88 in figure 3) disposed in series (the output of PM1 is the input of PM2 in figure 3) to phase modulate light from a source laser (the input of figure 3 is illustrated in 18, figure 1).

Wherein modulation by a first phase modulator (PM1 in figure 3) is phase modulation that produces phase shifts of 0 degree or 2Φ degrees (the phase modulators can phase modulate by o degrees, page 3, paragraph 0028. It should be noted that paragraph 0028 talks about the modulators of figure 2, however, paragraph 0036 of page 4, supports the fact that the modulators are the same in figure 3), and

Modulation by an n-th phase modulator is phase modulation that produces phase shifts of 0 degrees of $2^n \times \Phi$ degrees, Φ degrees being a predetermined phase level and n an integer that is not less than two and not more than the number of phase modulators (the phase modulators can phase modulate by o degrees, page 3, paragraph 0028. It should be noted that paragraph 0028 talks about the modulators of figure 2, however, paragraph 0036 of page 4, supports the fact that the modulators are the same in figure 3).

(2) With respect to claims 3 and 8:

As shown in figure 3, Choudhary et al. teaches an optical phase multi-level modulation method comprising:

using a first and a second phase modulators (PM1 and PM2, blocks 88 in figure 3) disposed in series (the output of PM1 is the input of PM2 in figure 3) to phase modulate light from a source laser (the input of figure 3 is illustrated in 18, figure 1).

Wherein modulation by the first modulator is modulation that produces phase shifts of 0 degrees or 180 degrees (the phase modulators can phase modulate by o degrees, page 3, paragraph 0028. It should be noted that paragraph 0028 talks about the modulators of figure 2, however, paragraph 0036 of page 4, supports the fact that the modulators are the same in figure 3), and

Modulation by the second phase modulator is modulation that produces phase shifts of 0 degrees or 90 degrees (the phase modulators can phase modulate by o degrees, page 3, paragraph 0028. It should be noted that paragraph 0028 talks about the modulators of figure 2, however, paragraph 0036 of page 4, supports the fact that the modulators are the same in figure 3).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2, 4, 5, 7, 9, 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Choudhary et al. (20030118352) in view of Takizawa (5,841,815).

(1) With respect to claims 2 and 7:

As shown in figure 3, Choudhary et al. teaches an optical phase multi-level modulation method comprising:

using a first and a second phase modulators (PM1 and PM2, blocks 88 in figure 3) disposed in series (the output of PM1 is the input of PM2 in figure 3) to phase modulate light from a source laser (the input of figure 3 is illustrated in 18, figure 1).

However, Choudhary et al. does not teach an in-phase component of quadrature modulation, and a quadrature component of quadrature modulation.

Takizawa teaches an in-phase component of quadrature modulation (output I of block 56 in figure 2), and a quadrature component of quadrature modulation (output Q of block 56 in figure 2).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use I and Q component of quadrature modulation taught by Takizawa in the phase modulation method taught by Choudhary et al. because it would provide high transmission efficiency (column 6, line 31).

(2) With respect to claims 4 and 9:

As shown in figure 3, Choudhary et al. teaches an optical phase multi-level modulation method comprising:

using a first and a second phase modulators (PM1 and PM2, blocks 88 in figure 3) disposed in series (the output of PM1 is the input of PM2 in figure 3) to phase modulate light from a source laser (the input of figure 3 is illustrated in 18, figure 1).

Wherein modulation by the first modulator is modulation that produces phase shifts of 0 degrees or 180 degrees (the phase modulators can phase modulate by o

degrees, page 3, paragraph 0028. It should be noted that paragraph 0028 talks about the modulators of figure 2, however, paragraph 0036 of page 4, supports the fact that the modulators are the same in figure 3), and

Modulation by the second phase modulator is modulation that produces phase shifts of 0 degrees or 90 degrees (the phase modulators can phase modulate by o degrees, page 3, paragraph 0028. It should be noted that paragraph 0028 talks about the modulators of figure 2, however, paragraph 0036 of page 4, supports the fact that the modulators are the same in figure 3).

However, Choudhary et al. does not teach an in-phase component of quadrature modulation, and a quadrature component of quadrature modulation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use I and Q component of quadrature modulation taught by Takizawa in the phase modulation method taught by Choudhary et al. because it would provide high transmission efficiency (column 6, line 31).

(3) With respect to claims 5 and 10:

As shown in figure 3, Choudhary et al. teaches an optical phase multi-level modulation method comprising:

using a first and a second phase modulators (PM1 and PM2, blocks 88 in figure 3) disposed in series (the output of PM1 is the input of PM2 in figure 3) to phase modulate light from a source laser (the input of figure 3 is illustrated in 18, figure 1).

Wherein modulation by the first modulator is modulation that produces phase shifts of 0 degrees or 90 degrees (the phase modulators can phase modulate by o

degrees, page 3, paragraph 0028. It should be noted that paragraph 0028 talks about the modulators of figure 2, however, paragraph 0036 of page 4, supports the fact that the modulators are the same in figure 3), and

Modulation by the second phase modulator is modulation that produces phase shifts of 0 degrees or 180 degrees (the phase modulators can phase modulate by o degrees, page 3, paragraph 0028. It should be noted that paragraph 0028 talks about the modulators of figure 2, however, paragraph 0036 of page 4, supports the fact that the modulators are the same in figure 3).

However, Choudhary et al. does not teach an in-phase component of quadrature modulation, and a quadrature component of quadrature modulation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use I and Q component of quadrature modulation taught by Takizawa in the phase modulation method taught by Choudhary et al. because it would provide high transmission efficiency (column 6, line 31).

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Choudhary et al. (20030118352) and Takizawa (5,841,815) as applied to claim 2 above, and further in view of Christensen (20050193319).

(1) With respect to claim 11:

Choudhary et al. and Takizawa teach all of the subject matter as described above, except for an error control method that detects and controls errors on a bit-by-bit basis, containing some of the same symbols as the respective information signals, and

on a receiving side confirms whether or not the logical levels of the decoded signals are the same.

Christensen teaches an error control method that detects and controls errors on a bit-by-bit basis (page 4, paragraph 0029, bit-by-bit check), containing some of the same symbols as the respective information signals, and on a receiving side confirms whether or not the logical levels of the decoded signals are the same (page 4, paragraph 0029, the method compares parity frames, and an error is detected if the two fails to match).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use error control method taught by Christensen in the receiver taught by Choudhary et al. because it would improve error correction performance.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Choudhary et al. (20030118352) and Takizawa (5,841,815) and Christensen (20050193319) as applied to claim 11 above, and further in view of Golitschek et al. (7,111,219).

(1) With respect to claim 12:

Choudhary et al. and Takizawa and Christensen teach all of the subject matter as described above, except for an error control method, in which, in said confirmation, logical levels are used to determine whether a state of said components is high, or low, with a determination only being used if it matches the component determination outcome concerned (H, M, or L).

Golistschek et al. teaches an error control method, in which, in said confirmation, logical levels are used to determine whether a state of said components is high, or low (column 7, lines 1 –5, describe the different states, high, medium, and low), with a determination only being used if it matches the component determination outcome concerned (H, M, or L) (the reference describes in column 7, the definition of the different levels).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the different levels of the state components taught by Golistschek et al. in the receiver taught by Choudhary et al. because it would increase the performance at the receiver.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Choudhary et al. (20030118352) and Takizawa (5,841,815) and Christensen (20050193319) and Golistschek et al. (7,111,219) as applied to claim 12 above, and further in view of Rollins (6, 452,714).

Choudhary et al. and Takizawa and Christensend and Golistschek et al. teach all of the subject matter as described above, except for the different delay times to cancel delay differences between symbols on a receiving side.

Rollins teaches the delay on a receiving side (54 in figure 2).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the delay taught by Rollins in the receiver taught by Choudhary et al. and Takizawa and Golistschek et al. because it would increase the accuracy of the receiver and the performance of the error correction.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guerssy Azemar whose telephone number is (571) 270-1076. The examiner can normally be reached on Mon-Fri (every other Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Guerssy Azemar

12/05/2006

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER